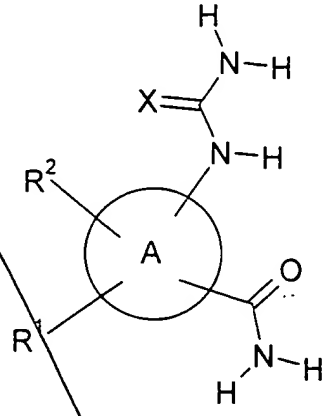
CLAIMS

1. A compound of formula (I)



(I)

in which:

A represents a 5-membered heteroaromatic ring containing one or two heteroatoms selected independently from oxygen, nitrogen or sulfur;

R^1 represents a phenyl group or a 5- to 7-membered heteroaromatic ring containing one to three heteroatoms selected independently from oxygen, nitrogen or sulfur; said phenyl or heteroaromatic ring being optionally substituted by one or more substituents selected independently from halogen, cyano, nitro, $-NR^3R^4$, $-CONR^5R^6$, $-COOR^7$, $-NR^8COR^9$, $-SR^{10}$, $-S(O)_mR^{10}$, $-SO_2NR^5R^6$, $-NR^8SO_2R^{10}$, C_1-C_6 alkyl, trifluoromethyl, $-(CH_2)_nR^{11}$, $-O(CH_2)_nR^{11}$ or $-OR^{12}$;

R^2 represents hydrogen, halogen, cyano, nitro, $-NR^{13}R^{14}$, $-CONR^{15}R^{16}$, $-COOR^{17}$, $-NR^{18}COR^{19}$, $-S(O)_mR^{20}$, $-SO_2NR^{15}R^{16}$, $-NR^{18}SO_2R^{20}$, C_1-C_2 alkyl, trifluoromethyl, C_2-C_3 alkenyl, C_2-C_3 alkynyl, trifluoromethoxy, C_1-C_2 alkoxy or C_1-C_2 alkanoyl;

X represents oxygen or sulphur;

each of R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10} and R^{12} independently represent a hydrogen atom or C_1-C_6 alkyl;

R^{11} represents $NR^{21}R^{22}$ where R^{21} and R^{22} are independently hydrogen or C_1-C_6 alkyl optionally substituted by C_1-C_4 alkoxy; or R^{21} and R^{22} together with the nitrogen atom to which they are attached form a 5- or 6-membered saturated ring optionally containing a further O, S or NR^{23} group where R^{23} is hydrogen or C_1-C_6 alkyl; or R^{11} represents OR^{24} where R^{24} represents C_1-C_6 alkyl;

each of R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19} and R^{20} independently represent a hydrogen atom or C_1-C_2 alkyl;

m represents an integer 0, 1 or 2;

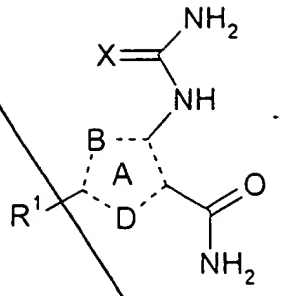
n represents an integer 2, 3 or 4;

and optical isomers, racemates and tautomers thereof and pharmaceutically acceptable salts or solvates thereof:

provided that:
when A represents thiophene, furan or pyrrole, then R^1 is not 4-pyridinyl or 3-pyrazolyl; and
when A represents oxazole, thiazole or imidazole, then R^1 is not 3-pyridinyl or 5-pyrimidyl.

2. A compound of formula (I), according to Claim 1, wherein X represents oxygen.

3. A compound of formula (I), according to Claim 1 or Claim 2, in which the group A is substituted as shown below in formula (Ia), where B and D are selected from CR^2, S, O and NR^{25}, where R^2 is as defined in Claim 1 and R^{25} is hydrogen or C_1-C_6 alkyl:



(Ia)

4. A compound according to any one of Claims 1 to 3 in which the ring A is thiophene.

5. A compound according to any one of Claims 1 to 4 in which R^1 represents optionally substituted phenyl.

6. A compound according to any one of Claims 1 to 5 in which R^2 represents H or methyl.

7. A compound according to Claim 6 in which R^2 represents H.

8. A compound of formula (I), according to claim 1, selected from:

3-[(aminocarbonyl)amino]-5-phenyl-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-(3-chlorophenyl)-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-(4-fluorophenyl)-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-(4-chlorophenyl)-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-(4-isobutylphenyl)-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-(2-thienyl)-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-(4-methoxyphenyl)-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-(3-thienyl)-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-(3-hydroxyphenyl)-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-(2-chlorophenyl)-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-(2-methoxyphenyl)-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-{2-[2-(dimethylamino)ethoxy]phenyl}-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-{4-[2-(dimethylamino)ethoxy]phenyl}-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-(3-methoxyphenyl)-2-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-phenyl-3-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-{4-[2-(1-morpholinyl)ethoxy]phenyl}-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-{4-[2-(1-pyrrolidinyl)ethoxy]phenyl}-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-{4-[2-(1-piperidinyl)ethoxy]phenyl}-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-{4-[3-(dimethylamino)propoxy]phenyl}-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-{3-[2-(dimethylamino)ethoxy]phenyl}-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-{3-[2-(1-morpholinyl)ethoxy]phenyl}-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-{3-[2-(1-pyrrolidinyl)ethoxy]phenyl}-2-thiophenecarboxamide;

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3-[(aminocarbonyl)amino]-5-{3-[2-(1-piperidinyl)ethoxy]phenyl}-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-{3-[3-(dimethylamino)propoxy]phenyl}-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-{2-[2-(1-morpholinyl)ethoxy]phenyl}-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-{2-[2-(1-pyrrolidinyl)ethoxy]phenyl}-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-{2-[2-(1-piperidinyl)ethoxy]phenyl}-2-thiophenecarboxamide;

3-[(aminocarbonyl)amino]-5-{2-[3-(dimethylamino)propoxy]phenyl}-2-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(4-chlorophenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(4-methylphenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-ethyl-5-phenyl-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(4-methoxyphenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(4-fluorophenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(3-fluorophenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(3-methoxyphenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(3-chloro-4-methoxyphenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(2-chlorophenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(3-trifluoromethylphenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(3-methyl-4-methoxyphenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(3,5-dimethoxyphenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(2,3-dimethoxyphenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(4-isopropylphenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(3,4,5-trimethoxyphenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(2-pyridyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]- 5-[2-(5-methoxypyridyl)]-4-methyl-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(4-pyrimidyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(2-pyrazinyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(3,4-dichlorophenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(4-cyanophenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(4-hydroxyphenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(4-[2-(1-piperidinyl)ethoxy]phenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(4-[2-(diethylamino)ethoxy]phenyl)-3-thiophenecarboxamide;

2-[aminocarbonyl)amino]-4-methyl-5-(2-furyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-trifluoromethyl-5-phenyl-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(2-(4-methylthiazolyl))-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-phenyl-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-4-methyl-5-(3-methyl-isoxazol-5-yl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(4-cyanophenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(4-trifluoromethylphenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(2,4-difluorophenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(2-pyridyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(3-pyridyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-[5-(2-methoxypyridyl]-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-[5-(2,4-dimethoxypyrimidyl)]-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(4-hydroxyphenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(4-chlorophenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(4-methanesulphonylphenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(2-(N-t-butoxycarbonyl)pyrrolyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(2-(5-cyanothienyl))-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(3,5-dimethyl-isoxazol-4-yl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(3-furyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(2-pyrrolyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(5-pyrimidinyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(2-(5-chlorothienyl))-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-[2-(5-trifluoromethylpyridyl)]-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-[2-(5-bromopyridyl)]-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(2-(5-cyanofuryl))-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(4-[2-(1-piperidinyl)ethoxy]phenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(4-[2-(1-(2,2,6,6-tetramethyl)piperidinyl)ethoxy]phenyl)-3-thiophenecarboxamide;

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2-[(aminocarbonyl)amino]-5-(4-(thiazol-4-yl-methoxy)phenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(4-[2-(dimethylamino)ethoxy]phenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(4-[2-(diethylamino)ethoxy]phenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(4-[2-(1-morpholinyl)ethoxy]phenyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(2-furyl)-3-thiophenecarboxamide;

2-[(aminocarbonyl)amino]-5-(2-(5-methylfuryl))-3-thiophenecarboxamide;

5-[(aminocarbonyl)amino]-2-(3,5-dichlorophenyl)-1,3-oxazole-4-carboxamide;

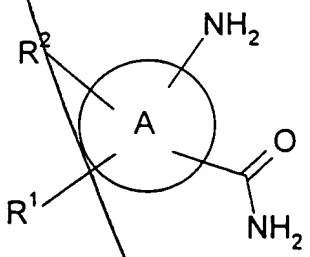
5-[(aminocarbonyl)amino]-2-(4-trifluoromethylphenyl)-1,3-oxazole-4-carboxamide;

2-[(aminothiocarbonyl)amino-5-phenyl-3-thiophenecarboxamide;

and pharmaceutically acceptable salts and solvates thereof.

9. A process for the preparation of a compound of formula (I), according to any one of Claims 1 to 8, which comprises:

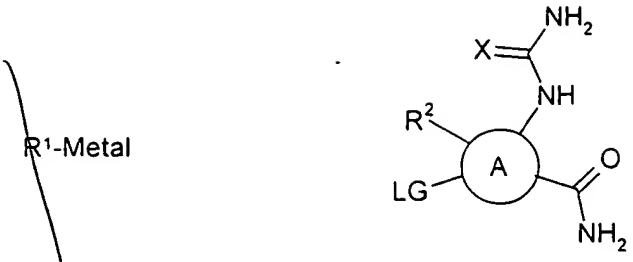
(a) reaction of a compound of formula (II):



(II)

wherein A, R^1 and R^2 are as defined in Claim 1 with an isocyanate (X = O) or an isothiocyanate (X = S); or

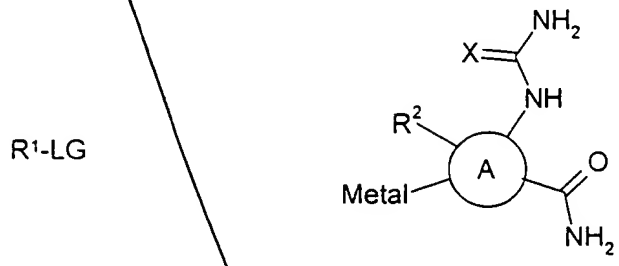
(b) reaction of compound of formula (III) with a compound of formula (IV)



(III) (IV)

wherein A, X, R^1 and R^2 are as defined in Claim 1 and LG represents a leaving group; or

(c) reaction of compound of formula (V) with a compound of formula (VI)



(V) (VI)

wherein A, X, R^1 and R^2 are as defined in Claim 1 and LG represents a leaving group;

and where necessary converting the resultant compound of formula (I), or another salt thereof, into a pharmaceutically acceptable salt thereof; or converting the resultant compound of formula (I) into a further compound of formula (I); and where desired converting the resultant compound of formula (I) into an optical isomer thereof.

10. A pharmaceutical composition comprising a compound of formula (I), or a pharmaceutically acceptable salt or solvate thereof, as claimed in any one of claims 1 to 8 in association with a pharmaceutically acceptable adjuvant, diluent or carrier.

11. A process for the preparation of a pharmaceutical composition as claimed in Claim 10 which comprises mixing a compound of formula (I), or a pharmaceutically acceptable

Sub B3

salt or solvate thereof, as claimed in any one of claims 1 to 8 with a pharmaceutically acceptable adjuvant, diluent or carrier.

Sub A3

12. A compound of formula (I), or a pharmaceutically-acceptable salt or solvate thereof, as claimed in any one of claims 1 to 8 for use in therapy.

13. Use of a compound of formula (I), or a pharmaceutically acceptable salt or solvate thereof, as claimed in any one of claims 1 to 8 in the manufacture of a medicament for use in therapy.

14. Use of a compound of formula (I), or a pharmaceutically acceptable salt or solvate thereof, as claimed in any one of claims 1 to 8 in the manufacture of a medicament for use in the treatment or prophylaxis of diseases or conditions in which inhibition of IKK2 activity is beneficial.

15. Use of a compound of formula (I), or a pharmaceutically acceptable salt or solvate thereof, as claimed in any one of claims 1 to 8 in the manufacture of a medicament for use in the treatment or prophylaxis of inflammatory disease.

16. The use as claimed in Claim 15 wherein the disease is asthma.

17. The use as claimed in Claim 15 wherein the disease is rheumatoid arthritis.

18. The use as claimed in Claim 15 wherein the disease is multiple sclerosis.

19. The use as claimed in Claim 15 wherein the disease is chronic obstructive pulmonary disease.

Sub A4

20. A method of treating an IKK2 mediated disease which comprises administering to a patient a therapeutically effective amount of a compound of formula (I), or a pharmaceutically acceptable salt or solvate thereof, as claimed in any one of claims 1 to 8.

Sub A4

21. A method of treating an inflammatory disease in a patient suffering from, or at risk of, said disease, which comprises administering to the patient a therapeutically effective amount of a compound of formula (I), or a pharmaceutically acceptable salt or solvate thereof, as claimed in any one of claims 1 to 8.

22. A method according to claim 21, wherein the disease is asthma.

23. A method according to claim 21, wherein the disease is rheumatoid arthritis.

24. A method according to claim 21, wherein the disease is multiple sclerosis.

25. A method according to claim 21, wherein the disease is chronic obstructive pulmonary disease.

add B4